



REPLY TO  
ATTENTION OF

DEPARTMENT OF THE ARMY  
US ARMY RESEARCH, DEVELOPMENT AND ENGINEERING COMMAND  
AVIATION AND MISSILE RESEARCH, DEVELOPMENT, AND ENGINEERING CENTER  
5400 FOWLER RD  
REDSTONE ARSENAL, ALABAMA 35898-5200

AMSRD-AMR-AE-T

26 Jun 06

MEMORANDUM FOR

Program Executive Officer, Aviation, (SFAE-AV), Redstone Arsenal, AL 35898  
Program Executive Officer, Soldier, 1-125 Kingman Road, Fort Belvoir, VA 22060-5820  
US Army Special Operations Command, Technology Applications Program Office  
(AMSAM-TASO-T), Building 401, Fort Eustis, VA 23604-5577  
National Guard Bureau (NGB-AVS-A), 111 South George Mason Drive, Alexandria, VA  
22204-1382

SUBJECT: Airworthiness Release for Operation of the Aviator's Night Vision Imaging System  
(ANVIS) AN/AVS-6 Series Night Vision Goggles (NVG) in Army Aircraft

- 1. Scope:** This memorandum constitutes an Airworthiness Release (AWR) in accordance with (IAW) Army Regulation 70-62 to authorize operation of the subject equipment in the AH-64A/D, UH-60A/L/Q, HH-60L, CH-47D, OH-58A/C/D, OH-58A (RAID), MH-60K/L, MH-60L Block II, MH-47D/E and UH-1 aircraft. This AWR has not been submitted to Army units or their respective Major Commands. This AWR should be forwarded to all operational units that require use of the subject equipment on these aircraft.
- 2. Validity:** This AWR supersedes reference D-11 AWR and terminates upon changes in configuration of the subject equipment, or upon issuance of a later AWR, whichever occurs first.
- 3. Appendices:** This memorandum and appendix A shall be carried in the logbook, and a complete AWR copy with all appendices kept in the aircraft historical record file.

**Appendix A** Restrictions and operating information

**Appendix B** Configuration and installation detail

**Appendix C** Inspections, maintenance, and logbook instructions

**Appendix D** Reference list



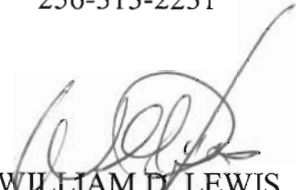
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4. For questions concerning this AWR, contact Mr. Steven Riebeling, AMSRD-AMR-AE-T, (256) 313-9152 or DSN 897-9152, E-mail [steven.riebeling@us.army.mil](mailto:steven.riebeling@us.army.mil). Other USARDECOM points of contact are:

<u>AIRCRAFT</u>	<u>POINT OF CONTACT</u>	<u>COMMERCIAL PHONE</u>	<u>DSN</u>
AH-64A/D	Mr. Lee Bumbicka	256-313-6314	897-6314
UH-60A/L	Mr. Gary Trotter	256-313-3116	897-3116
OH-58D	Mr. Gerald Johnson	256-313-2233	897-2233
MH-60K/L	Mr. Jesse Gambee	256-313-9153	897-9153
CH-47D	Mr. Dennis Ganey	256-876-4658	746-4658
MH-47D/E/G	Mr. Steven Riebeling	256-313-9152	897-9152
UH-1H/V	Mr. Darrel Hutson	256-313-2231	897-2231



WILLIAM D. LEWIS

Director of Aviation Engineering

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## **Appendix A. Restrictions and Operating Information:**

### **1. Restrictions:**

#### **NOTE**

The equipment identified below have not been Electromagnetic Compatibility (EMC) tested against the MX10160B or MX10160C image intensifiers during qualification of the subject equipment.

a. The following equipment is prohibited from use during NVG operations until EMC testing, as defined by paragraph B-3a has been conducted.

- (1) ARC-220 for AH-64D and OH-58D (not normal installation).
- (2) Secure mode, ARC-164 for AH-64A (not normal installation).
- (3) Blade de-ice for AH-64A and UH-60A/Q and HH-60L.
- (4) Any equipment not listed as part of table 2 of reference D-3 Test Report for MH-47D/E and MH-60K/L aircraft.
- (5) ASE or secure radio mode for OH-58A/C (not normal installation).
- (6) ARC-222 FM band for UH-60Q.

### **2. Operating Information:**

a. The aircraft shall be operated IAW the applicable aircraft operators manual except as modified by this AWR.

#### **NOTE**

When using the ITT NVGs during exposure to certain electromagnetic emitters, the low battery voltage light may be observed as constantly lit. The battery connector to the goggles may also get warm to the touch. The goggle operating time on battery power or normal goggle operation should not be affected. This light should extinguish after non-exposure of six hours. For true low battery voltage, this light should blink.

b. The subject equipment is operated IAW the reference D-1 and D-8 manuals.

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**NOTE**

During Electromagnetic Interference (EMI) testing, the OH-58D Aircraft Power Converter (APC) showed anomalies. If the performance of the NVG degrades, switch the NVGs to battery power to see if performance improves.

In the AH-64D, Video Underlay reflection in the copilot/gunner overhead canopy may negatively impact NVG performance in the Pilot station.

c. Use of ANVIS AN/AVS-6 NVGs in both crew stations was approved for AH-64D via reference D-7 AWR.

3. Emergency procedures: None.

4. Commander's Corner: This AWR assures safety of flight with the subject equipment.

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## **Appendix B. Configuration and Installation Detail:**

a. ANVIS Configuration: The ANVIS image intensifiers are defined by reference D-4 drawing (MX-10160B) and reference D-5 drawing (MX-10160C). The reference D-10 memorandum has certified the following:

(1) ANVIS AN/AVS-6 Type 2 (MX-10160 or later tube), Class A and equivalent Class B are acceptable for use in all US Army Class A compatible aircraft not equipped with the Common Avionics Architecture System (CAAS) or other multiple Active Matrix Liquid Displays (AMLCDs).

(2) ANVIS AN/AVS-6 Type 4 (MX-10160A tube) or later ANVIS AN/AVS-6, and Class B ANVIS with equal or better resolution are acceptable and safe for use in all US Army Class A compatible aircraft including those equipped with Class A compatible CAAS or other Class A compatible AMLCDs.

b. This memorandum does not certify safe use of any NVG not controlled by Product Manager Sensors and Lasers.

c. The referenced D-6 ECP is approved for use in the aircraft listed in memorandum paragraph 1.

### **NOTE**

This AWR does not render invalid any other AWRs currently covering the aircraft indicated above. Any interference (physical or operational) between this installation and other installations shall be reported, prior to flight, to the respective point of contact identified in memorandum paragraph 4.

2. Aircraft Configuration: The US Army aircraft are defined per their applicable Operator's Manual, to include all changes, and applicable Interim Statement of Airworthiness Qualification (ISAQ).

### **CAUTION**

Any operational interference between the subject equipment and other installations including any other authorized modification may damage the equipment and precipitate a more serious condition. Interference shall be reported prior to subsequent operation in flight. For resolution, report interference to the aircraft POC in memorandum paragraph 4.

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**NOTE**

Any change in ANVIS configuration is not authorized and will void this AWR.

3. Installation verification and quality checks:

**NOTE**

The EMC test defined below is not required on aircraft which have previously been tested with the MX-10160B image intensifiers.

The UH-1 Helicopter has not been EMC tested against the subject equipment. Operation of the subject equipment in UH-1H/V will require EMC test prior to first flight.

a. If aircraft listed in paragraph A-1a are configured with the equipment listed in paragraph A-1a, and if operators wish to use the subject equipment during NVG operation, a qualitative EMC test shall be conducted, once per aircraft type, to demonstrate that the equipment does not serve as sources or victims of electromagnetic interference with the existing electrical/electronic subsystems. This EMC test requirement also applies to aircraft with nonstandard equipment (i.e. equipment not authorized in the operator's manual or ISAQ). This shall be accomplished by monitoring (including visual and audio) the performance of all new and existing subsystems as individual subsystems are operated in turn. Operation of equipment includes a power-on/power-off cycle, initializing or warm-up (if applicable), and all modes of operation. All equipment shall be in the "in-flight" configuration and powered using aircraft generated power. The EMC test shall be conducted under Visual Flight Rules (VFR) conditions. Any EMC anomalies shall be reported to the applicable USARDECOM point of contact in memorandum paragraph 4, prior to next flight. The aircraft shall not be considered airworthy unless the tests demonstrate that the equipment does not serve as sources (initiators) or recipients of electromagnetic interference. A letter report will be submitted to USARDECOM, Steven Riebeling, no later than 10 days after the test.

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### **Appendix C. Inspections, Maintenance, and Logbook Instructions:**

1. Logistic support may be available from the Project Manager for Soldier Equipment (POC Jaimie Gonzalez, 703-704-3212 or email [jaimie.gonzalez@us.army.mil](mailto:jaimie.gonzalez@us.army.mil)).
2. The subject equipment shall be maintained IAW the reference D-2 and D-9 manuals.

#### **NOTE**

The following tests are only required for equipment not included in the aircraft's applicable Operator's Manual. These tests are not required for equipment previously tested with the ANVIS AN/AVS-6(V)1, ANVIS AN/AVS-6(V)1A, or ANVIS AN/AVS-6(V)3 NVGs or the MX-10160B image intensifiers.

3. Prior to conducting any night vision aided flights, an evaluation of the acceptability of the cockpit with ANVIS AN/AVS-6 night vision goggles shall be conducted. On a night with no moon, locate the aircraft in an area of very low ambient light, set interior lighting for NVG operations, and prepare the NVG for use. Check for blooming of the NVGs, light leaks, and reflections utilizing the following methods. Failure to meet the criteria below will require restricting the aircraft from NVG flights:

- a. With the aircraft lighting off, scan the outside scene with the NVGs. Note the scene resolution obtained. Turn on the aircraft lighting for NVG use and scan the outside scene again, noting the scene resolution. A perceptible DECREASE in scene resolution indicates the aircraft configuration is unacceptable for NVG flights.

- b. With the unaided eye, look for reflections cast on the windscreen or side windows. Observe any reflections seen through the NVGs. An NVG acceptable light source will allow NVG aided vision through its reflection. If the reflection blocks or interferes with NVG aided vision, the light source is unacceptable for use during NVG flight.

- c. Scan the cockpit for light leaks and blooming of the NVGs. Light sources which cause excessive blooming of the NVGs will be unacceptable for NVG flight. Any light leaks must be remedied prior to NVG flights.

- d. Upon successful completion of the above NVG procedures, notify the POC in memorandum paragraph 4 regarding the results of the test.

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#### 4. Aircraft Logbook Entries:

##### NOTE

The following writeups do not affect aircraft being flown with ANVIS AN/AVS-6(V)1 or the ANVIS AN/AVS-6(V)1A.

a. In accordance with Department of the Army (DA) Pamphlet 738-751, the following entries shall be made on the DA Form 2408-13-1/2408-13-1-E and shall be perpetuated on each form during the period of installation or until superseded by another AWR, or until reason for limitation is removed.

(1) Place a circle red "X" on the form IAW DA Pamphlet 738-751. In the Fault Information Block, make the following entry: "When flying with ANVIS AN/AVS-6 series NVGs, operate the NVGs IAW the enclosed AWR dated **26 Jun 06**."

(2) Place a red dash in the status block to be followed in the fault/remarks block with "EMC test required prior to the next flight IAW the enclosed Airworthiness Release dated **26 Jun 06**." This is only required for equipment listed in paragraph A-1a, or equipment not included in the aircraft's applicable Operator's Manual. This test is not required for aircraft tested with the MX-10160B image intensifiers. Contact the aircraft POC listed in memorandum paragraph 4 for applicable EMC test procedures. A copy of the EMC results shall be submitted to the AWR POC (Steven Riebeling) upon completion of test. Upon successful completion of the required test and delivery of the EMC results to the AWR POC, the dash can be cleared.

(3) Place a red dash in the status block to be followed in the fault/remarks block with "Perform NVG lighting evaluation prior to next NVG flight IAW the enclosed Airworthiness Release dated **26 Jun 06**." This is only required for equipment not included in the aircraft's applicable Operator's Manual. This test is not required for equipment tested with the MX-10160B image intensifiers. Upon successful completion of the NVG procedures, and delivery of the results to the POC in memorandum paragraph 4, the red dash can be cleared.

(4) The remaining blocks in the Fault Information Block will be completed per DA Pamphlet 738-751. After the description of the write-up entries, insert "For DA Form 1352 reporting purposes, the above write-ups shall not cause the aircraft to be reported as Partially Mission Capable (PMC). Aircraft which are nonstandard configured and operating under this Airworthiness Release may be reported as Fully Mission Capable (FMC)."

b. The aircraft DA Form 2408-15 shall be annotated to reflect the successful completion of the EMC test and to cite this airworthiness release by subject and date.



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**Appendix D Reference List:**

1. Technical Manual 11-5855-313-10, with latest changes, titled: Operators Manual, Aviator's Night Vision Imaging System (ANVIS), AN/AVS-6(V)3, 1 Feb 04.
2. Technical Manual 11-5855-313-23&P, Aviation Unit and Intermediate Maintenance Manual Including Repair Parts and Special Tools List, Aviator's Night Vision Imaging System (ANVIS), AN/AVS-6(V)3, 15 Feb 03.
3. Test Report, TIR KF-F000003, Aviation Technical Test Center, 20 Mar 02, subject: Special Operations Aircraft Test Summary, Phase II.
4. Drawing number A3279593, subject: Image Intensifier Assembly, High Performance, MX-10160B/AVS-6.
5. Drawing number A3279602, subject: Image Intensifier, Assembly, MX-10160C/AVS-6.
6. Engineering Change Proposal (ECP) J008-003, ITT Industries, Incorporate Non-rotational Objective Lens Assembly for HUD and ODA Compatibility.
7. Memorandum, USARDECOM, AMSRD-AMR-AE-D, 4 Oct 04, subject: Airworthiness Release (AWR) Authorizing Use of Night Vision Goggles (NVG) in both Crew Stations in US Army AH-64D Helicopters.
8. Technical Manual 11-5855-263-10, with latest changes, titled: Operators Manual, Aviator's Night Vision Imaging System (ANVIS), AN/AVS-6(V)1 and AN/AVS-6(V)2, 1 Feb 04.
9. Technical Manual 11-5855-263-23&P, Aviation Unit and Intermediate Maintenance Manual Including Repair Parts and Special Tools List, Aviator's Night Vision Imaging System (ANVIS), AN/AVS-6(V)1, AN/AVS-6(V)2, AN/AVS-6(V)1A, and AN/AVS-6(V)1B, 15 Sep 01 with change 1 dated 1 Mar 03.
10. Memorandum, Product Manager Sensors and Lasers, SFAE-SDR-SEQ, Mar 05, subject: Night Vision Goggles (NVG) for US Army Aviation.
11. Memorandum, HQRDECOM, AMSRD-AMR-AE-T, 12 Apr 05 with revision 1, 14 Apr 05, subject: Airworthiness Release for Operation of the Aviator's Night Vision Imaging System (ANVIS) 6 Series Night Vision Goggles (NVG) in Army Aircraft.